

Claims

This listing of claims will replace all prior versions of the claims in the application:

Listing of Claims:

Claims 1-43 (Cancelled)

44. (Withdrawn) A method of treatment or prevention of meningococcal disease comprising administering to a subject an effective amount of *Neisseria* outer membrane vesicles which contain Opa that does not bind to *CEACAM1* which are substantially free of Opa that binds *CEACAM1*, wherein said outer membrane vesicles are from *Neisseria* that have been modified by mutation to express an Opa that does not bind to *CEACAM1*.

45. (Withdrawn) The method of Claim 44, wherein activation or proliferation of CD4+ T cells is enhanced.

46. (Withdrawn) The method of Claim 44, wherein said *Neisseria* is *Neisseria meningitidis*.

47. (Withdrawn) The method of Claim 44, wherein stimulation of immune memory is improved or inhibition of T cell function is reduced.

48. (Withdrawn) The method of Claim 44, wherein said mutation is by a method mutagenesis selected from the group consisting of transposon mutagenesis, UV light, EMS mutagenesis and NTG mutagenesis.

49. (Withdrawn) The method of Claim 44, wherein said administering is selected from the group consisting of parenteral, intramuscular, trans-dermal, intra-nasal, oral, topical or mucosal.

50. (Withdrawn) The method of Claim 44, wherein said outer membrane vesicles comprise a heterologous antigen.

51. (Currently Amended) A method of treatment or prevention of meningococcal disease comprising administering to a subject an effective amount of a composition comprising *Neisseria* outer membrane vesicles from *Neisseria meningitidis*, *Neisseri gonorrhoeae* or *Neisseri lactamica*, wherein said outer membrane vesicles ~~are free~~ have a reduced content of *Neisseria* Opa that binds to human CEACAM1.

52. (Previously Presented) The method of Claim 51, wherein stimulation of immune memory is improved or inhibition of T cell function is reduced, as compared with a composition comprising *Neisseria* outer membrane vesicles that contain *Neisseria* Opa that binds to human CEACAM1.

53. (Previously Presented) The method of Claim 51, wherein said composition comprises a carrier.

54. (Previously Presented) The method of Claim 53, wherein said carrier is selected from the group consisting of saline solution, sucrose solution, or a pharmaceutically acceptable buffer solution.

55. (Previously Presented) The method of Claim 51, wherein said composition comprises a surfactant.

56. (Previously Presented) The method of Claim 51, wherein said composition comprises an adjuvant.

57. (Previously Presented) The method of Claim 51, wherein said composition comprises microencapsulated outer membrane vesicles.

58. (Previously Presented) The method of Claim 57, wherein said microencapsulated outer membrane vesicles comprise a biocompatible polymer shell or core.

59. (Previously Presented) The method of Claim 58, wherein said biocompatible polymer shell or core is made from polylactide-co-glycolide.

60. (Withdrawn - previously presented) A method of preparing a vaccine composition for treatment or prevention of meningococcal disease, the method comprising:

(a) isolating *Neisseria* outer membrane vesicles which contain Opa that does not bind to *CEACAM1* and which are substantially free of Opa that binds *CEACAM1*, wherein said outer membrane vesicles are from *Neisseria* that have been modified by mutation to express an Opa that does not bind to *CEACAM1*; and

(b) formulating the composition for use as a vaccine.

61. (Withdrawn - previously presented) A method of preparing a vaccine composition for treatment or prevention of meningococcal disease, the method comprising:

(a) obtaining a *Neisseria*;

(b) determining whether the *Neisseria* expresses an Opa protein that binds to *CEACAM1*;

(c) if the *Neisseria* expresses an Opa protein that binds to *CEACAM1*, discarding the *Neisseria* and repeating steps (a) to (c);

(d) retaining the *Neisseria* if it expresses a mutant or variant or fragment or derivative of Opa, wherein the mutant or variant or fragment or derivative does not bind to *CEACAM1*; and

(e) preparing a composition comprising the retained *Neisseria* of step (d).

62. (Withdrawn - previously presented) The method of Claim 60, wherein said mutant or variant or fragment or derivative is obtained by:

(i) obtaining a *Neisseria*;

(ii) carrying out mutagenesis on the *Neisseria*;

(iii) determining whether the *Neisseria* expresses a mutant or fragment or variant or

derivative of an Opa protein that does not bind to *CEACAM1*;

(iv) isolating said mutant or variant or fragment or derivative, wherein the mutant or variant or fragment or derivative does not bind to *CEACAM1*.

63. (Withdrawn - previously presented) The method of Claim 61, wherein said mutagenesis is selected from the group consisting of transposon mutagenesis, UV light, EMS mutagenesis and NTG mutagenesis.

64. (Withdrawn - previously presented) The method of Claim 60, wherein said determining comprises exposing said Opa protein to a *CEACAM1-Fc* fusion protein in an ELISA assay.

65. (Withdrawn - previously presented) The method of Claim 63, wherein said determining further comprises contacting said Opa protein with an Opa-specific monoclonal antibody.

66. (Withdrawn - previously presented) The method of Claim 60, wherein said determining comprises characterizing the interaction between said Opa protein and *CEACAM1* by ELISA.

67. (Withdrawn - previously presented) The method of Claim 61, further comprising:
(v) raising an antibody to the mutant or fragment or variant or derivative; and
(vi) determining whether the antibody also binds to an Opa protein that binds to *CEACAM1*.

68. (Withdrawn - previously presented) The method of Claim 60, wherein the *Neisseria* is *Neisseria meningitidis*.

69. (Withdrawn - previously presented) The method of Claim 60, comprising preparing an outer membrane vesicle from the retained *Neisseria*.

70. (Currently Amended) The method of claim 51, wherein the outer membrane vesicles further contain *Neisseria* Opa that does not bind to human *CEACAM1* and wherein said outer membrane vesicles are from ~~*Neisseria*~~ *Neisseria meningitidis*, *Neisseri gonorrhoeae* or *Neisseri lactamica* that have been modified by mutation to express a *Neisseria* Opa that does not bind to human *CEACAM1*.

71. (New) A method of treatment or prevention of meningococcal disease, comprising administering to a subject an effective amount of a composition comprising outer membrane vesicles from *N. meningitidis*, *N. gonorrhoeae* or *N. lactamica*; wherein said outer membrane vesicles have a reduced content of *Neisseria* Opa that binds to human CEACAM1 as compared with the *Neisseria* Opa content of outer membrane vesicles from *N. meningitidis* strain K454.

72. (New) A method according to Claim 71, wherein the content of *Neisseria* Opa that binds to human CEACAM1 is reduced by a factor of at least 10 as compared with the *Neisseria* Opa content of outer membrane vesicles from *N. meningitidis* strain K454.

73. (New) A method of treatment or prevention of meningococcal disease, comprising administering to a subject an effective amount of a composition comprising outer membrane vesicles from *N. meningitidis*, *N. gonorrhoeae* or *N. lactamica*, wherein said outer membrane vesicles have a reduced content of *Neisseria* Opa that binds to human CEACAM1;

wherein the content of *Neisseria* Opa that binds to human CEACAM1 in said outer membrane vesicles is reduced to 0.5% or less by weight of the total protein content of the outer membrane vesicles.